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Himanshu S. Amin
AMIN & TUROCY, LLP
24th Floor, National City Center
1900 East 9th Street
Cleveland, OH 44114

| EXAMINER | |
|---|---|
| ROBINSON BOYCE, AKIBA K | |

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| 3623 | |

DATE MAILED: 10/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/681,050 | CHICKERING ET AL. | |
| | Examiner | Art Unit | |
| | Akiba K Robinson-Boyce | 3623 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Status of Claims*

1. Due to communications filed 7/26/04, the following is a final office action. Claims 1, 2, 6, 11-25 and 27 have been amended. Claims 28-30 have been added. Claims 1-30 are pending in this application and have been examined on the merits. The previous rejection has been withdrawn, and the following reflects the claims as amended. Claims 1-30 are rejected as follows.

### *Claim Rejections - 35 USC § 101*

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to a non-statutory subject matter.

The basis of this rejection is set forth in a two-prong test of :

(1) whether the invention is within the technological arts; and

(2) whether the invention produces a useful, concrete, and tangible result.

For a claimed invention to be statutory, the claimed invention must be within the technological arts. Mere ideas in the abstract (i.e., abstract idea, law of nature, natural phenomena that do not apply, involve, use, or advance the technological arts fail to promote the "progress of science and the useful art" (i.e., the physical sciences as opposed to social sciences, for example) and therefore are found to be non-statutory

subject matter. For a process claim, the recited process must somehow apply, involve, use, or advance the technological arts.

In the present case, claim 1 is directed to a method for soliciting a sub-population of a population. Claim 1 recites the steps of "identifying the sub-population...using a computer-implemented decision theoretic model...", and "soliciting the sub-population". These steps represent mere ideas in the abstract since they do not comprise physical means or software embodied on a tangible medium to carry out all of the steps of the process. Since these means do not exist, claim 1 and all claims that depend from it (Claims 2-10) are therefore are found to be non-statutory.

Additionally, for a claimed invention to be statutory, the claimed invention must produce a useful, concrete, and tangible result.

In the present case, claim 1 is directed to a method for soliciting a sub-population of a population. Claim 1 recites the steps of "identifying the sub-population...", and "soliciting the sub-population". These steps do not produce a useful, concrete, and tangible result, thereby making the claim and all claims that depend from it (Claims 2-10) are non-statutory.

As to technology recited in the preamble, mere recitation in the preamble (i.e., intended or field of use) or mere implication of employing a machine or article of manufacture to perform some or all of the recited steps does not confer statutory subject matter to an otherwise abstract idea unless there is positive recitation I the claim as a whole to breathe life and meaning into the preamble.

In the present case, claims 11 and 24 are directed to a computer-implemented method for constructing a decision theoretic model to identify a sub-population of a population to solicit to maximize an expected increase in profits. Claims 11 and 24 recite the steps of "performing an experiment...", "constructing a decision tree...", "applying the decision tree...". These steps represent mere ideas in the abstract since they do not comprise physical means or software embodied on a tangible medium in the body of the claim to carry out this process. Since these means do not exist, claim 11 and claims 12-22, all which depend from claim 11, and claim 24, and claims 25-26, all which depend from claim 24 are therefore found to be non-statutory.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 10, 28, are rejected under 35 U.S.C. 103(a) as being unpatentable over Tom (US 5,696,907).

As per claims 1, 10, Tom discloses:

Identifying the sub-population to solicit by using a decision theoretic model, the decision theoretic model constructed to maximize an expected increase in profits, (Col. 7, lines 10-22, selecting10% lowest and highest applications, evaluating a set of sample financial service applications using a hierarchical neural network model {represents the

decision theoretic model}, focusing on not having much increase in loss, {represents the maximization of profits since the lower the loss, the greater the profit, where the performance of the risk and credit analysis on financial service applications represents the solicitation); and

Soliciting the sub-population identified, (Col. 8, lines 8-10, providing data from the application to be evaluated).

Tom doesn't specifically use the word "solicit", however, the performance of risk and credit analysis on financial service applications represents the solicitation since financial applications can be evaluated for risk and credit analysis in order to urge, entice or lure an applicant into getting a financial service.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to solicit applicants with the motivation of enticing the applicant to receive a financial service.

As per claim 10, Tom doesn't specifically disclose:

Wherein soliciting the sub-population identified comprises calling each of a plurality of members of the sub-population. However, Tom does disclose a system that uses decision process and model to perform an evaluation of a sub-population represented by organized groups in Col. 7, lines 10-22.

Official notice is taken that it is old and well known in the solicitation art to call each of a plurality of members of the sub-population with the motivation of successfully attempting to contact the members by telephone. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to call each of a plurality of

members of a sub-population with the motivation of using telephonic means to contact members and make a decision after the evaluation process.

As per claim 28,Tom discloses:

receives input regarding a population, (Col. 7, lines 53-54, collecting data); and

A decision theoretic model that determines a subset of the population to solicit with the advertising so as to maximize an expected increase in profits from the solicitation, (Col. 7, lines 10-22, selecting10% lowest and highest applications, evaluating a set of sample financial service applications using a hierarchical neural network model {represents the decision theoretic model}, focusing on not having much increase in loss, {represents the maximization of profits since the lower the loss, the greater the profit, where the performance of the risk and credit analysis on financial service applications represents the solicitation);

The "module" feature is obvious with Tom since it is taught that a computer implementation is utilized to collect data about a financial population in col. 7, lines 46-55.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to incorporate a module with the motivation of utilizing a unit of the computer system that will handle receipt processing.

6. Claims 2-4, 6, 8, 29, are rejected under 35 U.S.C. 103(a) as being unpatentable over Tom (US 5,696,907) as applied to claim1 above, and further in view of Kohavi (US 6,182,058).

As per claims 2, 29, Tom fails to disclose "wherein using the decision theoretic model comprises using a decision tree, the decision tree having a plurality of paths from a root node to a plurality of leaf nodes, each of the plurality of paths having a split on a solicitation variable having a first value corresponding to solicitation and a second value corresponding to non-solicitation", but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However, Kohavi discloses:

wherein using the decision theoretic model comprises using a decision tree, the decision tree having a plurality of paths from a root node to a plurality of leaf nodes, each of the plurality of paths having a split on a solicitation variable having a first value corresponding to solicitation and a second value corresponding to non-solicitation, (Col. 3, lines 10-16, Fig. 6 [616], where the solicit value is represented by the make route node a decision node, and the non-solicit value is represented by make route node a leaf node]). Kohavi discloses this limitation in an analogous art for the purpose of showing that decision nodes are used to determine a solution for certain attributes.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to utilize a decision tree with the motivation of showing that solutions that come from the decision tree can go through several paths to come up with a solution.

As per claim 3, Tom fails to disclose "wherein the decision tree is constructed such that the split on the solicitation variable of each of the plurality of paths is a last

s p l it ", but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However Kohavi discloses:

wherein the decision tree is constructed such that the split on the solicitation variable of each of the plurality of paths is a last split, (Col. 4, lines 54-67, [when test result = true, classification occurs and a label is output, this represents the last split]). Kohavi discloses this limitation in an analogous art for the purpose of showing that the last split leads to the final decision.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct the decision tree such that the split on the solicitation variable represents the last split with the motivation on determining a final decision on the solicitation variable in order to decide who to solicit.

As per claim 4, Tom fails to disclose "wherein the decision tree is constructed such that the split on the solicitation variable of each of the plurality of paths is a first Split", but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However Kohavi discloses:

wherein the decision tree is constructed such that the split on the solicitation variable of each of the plurality of paths is a first Split, (Col. 4, lines 54-67, Fig. 6, [when test result = no, the path will lead back to the beginning of the process]). Kohavi discloses this feature in an analogous art for the purpose of showing that a decision can occur at the beginning of the process.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct a decision tree such that the split on the solicitation variable of each of the plurality of paths is a first split with the motivation of showing that a decision with respect to solicitation can occur at the beginning of a process.

As per claim 6, Tom discloses:

a sample of the population using a predetermined scoring criterion, (Col. 7,lines 54-55, [previously approved applications],

a probability conditional, (Col. 2, lines 22-28, [compute probability of each class given an instance]).

Tom fails to disclose constructing the decision tree from, each of the plurality of leaf nodes of the tree providing a value...on at least the purchase variable, but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However Kohavi discloses:

constructing the decision tree from, each of the plurality of leaf nodes of the tree providing a value..., (Col. 3, lines 10-16, [shows the decision tree contains root, leaf nodes])

applying the decision tree against the population to identify the sub-population to solicit to maximize the expected increase in profits, (Col. 7, line 64-Col. 8, line 2, [classifier applying the decision tree to produce an output]).

Kohavi discloses the above limitations in an analogous art for the purpose of producing an output by means of a decision tree.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct a decision tree and apply a decision tree with the motivation of utilizing a decision tree to produce an output.

As per claim 8, Tom fails to disclose wherein soliciting the sub-population identified comprises mailing a solicitation to each of a plurality of members of the sub-population, but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However, Kohavi discloses:

wherein soliciting the sub-population identified comprises mailing a solicitation to each of a plurality of members of the sub-population, (Col. 1, lines 52-57, [mail sent only to people who are labeled by classifier). Kohavi discloses this limitation in an analogous art for the purpose of sending mail to a population during a campaign.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to mail a solicitation to each of a plurality of members of the sub-population with the motivation of utilizing postal services for solicitation.

7. Claims 5, 7, 11, 13-24, 26, 27, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tom (US 5,696,907) as applied to claim1 above, and further in view of Kohavi (US 6,182,058), and Pilipovic (US 6,456,982).

As per claims 5, 30, Tom fails to disclose wherein each of the plurality of leaf nodes provides a value for a probability conditional on at least a purchase variable, but Tom does disclose a system that uses decision process and model to perform an evaluation in Col. 7, lines 10-22.

However, Kohavi discloses wherein each of the plurality of leaf nodes provides a value for a probability conditional on at least a purchase variable in Col. 2, line 22-28 where the computation of the probability of each class given an instance. Kohavi discloses this limitation in an analogous art for the purpose of showing that a decision can be made based on particular conditions.

Neither Tom, not Kohavi disclose having a first value corresponding to purchase and a second value corresponding to non-purchase.

However, Pilipovic discloses:

having a first value corresponding to purchase and a second value corresponding to non-purchase, (Col. 92, lines 23-28, [buy/keep decision]). Pilipovic discloses this limitation in an analogous art for the purpose of showing that a buy/keep decision node can be incorporated into a decision system.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have values corresponding to purchase and non-purchase with the motivation of showing that a decision can comprise the usage of purchase variables.

As per claim 7, Tom discloses:

wherein identifying the sub-population to solicit further initially comprises performing an experiment using the sample of the population to obtain values for the sample of the population for each of the solicitation variable, (col. 7, lines 53-67, [applying to groups]),

Neither Tom, nor Kohavi disclose "and a purchase variable, the purchase variable having a first value corresponding to purchase and a second value corresponding to non-purchase".

However, Pilipovic discloses:

"and a purchase variable, the purchase variable having a first value corresponding to purchase and a second value corresponding to non-purchase", (Col. 92, lines 23-28, [buy/keep decision]). Pilipovic discloses this limitation in an analogous art for the purpose of showing that a buy/keep decision node can be incorporated into a decision system.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have values corresponding to purchase and non-purchase with the motivation of showing that a decision can comprise the usage of purchase variables.

As per claims 11, 24, Tom discloses:

performing an experiment using a sample of the population to obtain values for the sample of the population for each of a solicitation variable, (col. 7, lines 10-22, [sample financial service applications]),

Tom fails to disclose "and a purchase variable, the solicitation variable having a first value corresponding to solicitation and a second value corresponding to non-solicitation", but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However, Kohavi discloses:

and a purchase variable, the solicitation variable having a first value corresponding to solicitation and a second value corresponding to non-solicitation, (Col. 3, lines 10-16, Fig. 6 [616], where the solicit value is represented by the make route node a decision node, and the non-solicit value is represented by make route node a leaf node]). Kohavi discloses this limitation in an analogous art for the purpose of showing that decision nodes are used to determine a solution for certain attributes.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to utilize a decision tree with the motivation of showing that solutions that come from the decision tree can go through several paths to come up with a solution.

Tom fails to disclose "constructing a decision tree as the decision theoretic model from the sample using a predetermined scoring criterion, the decision tree having a plurality of paths from a root node to a plurality of leaf nodes, each of the plurality of paths having a split on the solicitation variable, and each of the plurality of leaf nodes providing a value for a probability conditional on at least the purchase variable', and, applying the decision tree against the population to identify the sub-population to solicit to maximize the expected increase in profits, but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However, Kohavi discloses:

Constructing a decision tree as the decision theoretic model from the sample using a predetermined scoring criterion, the decision tree having a plurality of paths from a root node to a plurality of leaf nodes, each of the plurality of paths having a split on the solicitation variable, and each of the plurality of leaf nodes providing a value for a probability conditional on at least the purchase variable', and, applying the decision tree against the population to identify the sub-population to solicit to maximize the expected increase in profits, (Col. 3, lines 10-16, Fig. 6 [616], where the solicit value is represented by the make route node a decision node, and the non-solicit value is represented by make route node a leaf node, col. 3, lines 17-31, [where applying the decision tree is represented by inducing the NB-Tree classifier]). Kohavi discloses this limitation in an analogous art for the purpose of showing that decision nodes are used to determine a solution for certain attributes.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to utilize a decision tree with the motivation of showing that solutions that come from the decision tree can go through several paths to come up with

Neither Tom, nor Kohavi disclose "and a purchase variable, the purchase variable having a first value corresponding to purchase and a second value corresponding to non-purchase".

However, Pilipovic discloses:

"and a purchase variable, the purchase variable having a first value corresponding to purchase and a second value corresponding to

non-purchase", (Col. 92, lines 23-28, [buy/keep decision]). Pilipovic discloses this limitation in an analogous art for the purpose of showing that a buy/keep decision node can be incorporated into a decision system.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have values corresponding to purchase and non-purchase with the motivation of showing that a decision can comprise the usage of purchase variables.

As per claim 13, Tom fails to disclose wherein construction the decision tree comprises using a greedy approach, however discloses disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However, Kohavi discloses:

wherein construction the decision tree comprises using a greedy approach in Fig.5, [500], in this figure, a plurality of interim leaf nodes shown in [516, 520,524, 528, and 532] are disclosed, which is a greedy approach. Kohavi discloses this approach in an analogous art for the purpose of showing an alternative approach for constructing a decision tree where many decision points will exist.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use a greedy approach with the motivation of using a decision tree that will generate many decision points.

As per claim 14, Tom fails to disclose wherein the predetermined scoring criterion is a holdout criterion, however discloses disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However, Kohavi discloses:

wherein the predetermined scoring criterion is a holdout criterion, (col. 8, lines 40-42, [holdout]. Kohavi discloses this limitation in an analogous art for the purpose of showing different methods of scoring in order to make a decision.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use holdout criterion with the motivation of using holdout criterion in order to generate a score.

As per claim 15, Tom fails to disclose wherein the predetermined scoring criterion is a cross-validation holdout criterion, however discloses a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However, Kohavi discloses:

wherein the predetermined scoring criterion is a cross-validation holdout criterion, (Col. 8, lines 40-42, [cross-validation]). Kohavi discloses this limitation in an analogous art for the purpose of showing different methods of scoring in order to make a decision.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use cross-validation criterion with the motivation of using cross-validation data in order to generate a score.

As per claims 16 and 17, neither Tom, Kohavi, nor Pilipovic discloses wherein the predetermined scoring criterion is a marginal likelihood criterion/wherein the predetermined scoring criterion is an adjusted marginal likelihood criterion, but Tom does disclose analyzing previously approved financial service applications to perform risk and credit analysis by optimizing weighted connections in Col. 7, line 53-Col. 8, line 8.

However official notice is taken that it is old and well known in the solicitation art to use a marginal likelihood criterion or an adjusted marginal likelihood criterion. It would have been obvious to one of ordinary skill in the art to use a marginal likelihood criterion or an adjusted marginal likelihood criterion with the motivation of using an alternative method of scoring members and scoring with respect to how likely a member would meet the criterion.

As per claim 18, Tom fails to disclose "wherein the split on the solicitation variable of each of the plurality of paths is a last split ", but does disclose a system that uses decision process and model to perform an evaluation in Col. 7, lines 10-22.

However Kohavi discloses:

wherein the split on the solicitation variable of each of the plurality of paths is a last split, (Col. 4, lines 54-67, [when test result = true, classification occurs and a label is output, this represents the last split]). Kohavi discloses this limitation in an analogous art for the purpose of showing that the last split leads to the final decision.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct the decision tree such that the split on the solicitation variable represents the last split with the motivation on determining a final decision on the solicitation variable in order to decide who to solicit.

As per claim 19, Tom fails to disclose the following, but does disclose a system that uses decision process and model to perform an evaluation in Col. 7, lines 10-22.

However Kohavi discloses:

initializing the decision tree with an initial single leaf node as the root

node, (Fig. 5 [504]) ;

using the greedy approach to construct the decision tree with no splits on the solicitation variable, the decision tree after construction using the greedy approach having a plurality of interim leaf nodes', and,

performing a split on the solicitation variable at each of the plurality of interim leaf nodes to generate the plurality of leaf nodes, (Fig. 5, [504], shows a plurality of leaf nodes in [516, 520, 524, 528, 532]). Kohavi discloses these limitations in an analogous art for the purpose of showing how the decision tree branches off into a plurality of decision points.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use a greedy approach with the motivation of using a decision tree that will generate many decision points.

As per claim 20, Tom fails to disclose "wherein the split on the solicitation variable of each of the plurality of paths is a first split at the root node", but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However Kohavi discloses:

wherein the split on the solicitation variable of each of the plurality of paths is a first split at the root node, (Col. 4, lines 54-67, Fig. 6, [when test result = no, the path will lead back to the beginning of the process]). Kohavi discloses this feature in an analogous art for the purpose of showing that a decision can occur at the beginning of the process.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct a decision tree such that the split on the solicitation variable of each of the plurality of paths is a first split with the motivation of showing that a decision with respect to solicitation can occur at the beginning of a process.

As per claim 21, Tom fails to disclose "initializing the decision tree with the first split at the root node on the solicitation variable ", but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However Kohavi discloses:

initializing the decision tree with the first split at the root node on the solicitation variable, (Col. 4, lines 54-67, Fig. 5 [504], [first split to [508] and [512] occurs at the root nod [504]). Kohavi discloses this feature in an analogous art for the purpose of showing that a decision can occur at the beginning of the process.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct a decision tree such that the split on the solicitation variable of each of the plurality of paths is a first split with the motivation of showing that a decision with respect to solicitation can occur at the beginning of a process.

using a greedy approach to finish constructing the decision tree, (Fig. 5, [504], shows a plurality of leaf nodes in [516, 520, 524, 528, 532]). Kohavi discloses these limitations in an analogous art for the purpose of showing how the decision tree branches off into a plurality of decision points.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use a greedy approach with the motivation of using a decision tree that will generate many decision points.

As per claim 22, Tom discloses:

Soliciting the sub-population identified, (Col. 8, lines 8-10, [providing data from the application to be evaluated]).

Tom doesn't specifically use the word "solicit", however, the performance of risk and credit analysis on financial service applications represents the solicitation since financial applications can be evaluated for risk and credit analysis in order to urge, entice or lure an applicant into getting a financial service.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to solicit applicants with the motivation of enticing the applicant to receive a financial service.

As per claims 23, 27,Tom fails to disclose wherein the method is performed by execution of a computer program by a processor from a computer-readable medium, but does disclose using a computer system by way of neural network as shown in Fig. 1.

However, Kohavi discloses:

wherein the method is performed by execution of a computer program by a processor from a computer-readable medium, (col. 7, lines 55-56, [computer program residing in a computer readable medium]). Kohavi discloses this limitation in an

analogous art for the purpose of showing that a processor aids in performing the steps of the invention.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to perform a method by execution of a computer program by a processor from a computer-readable medium with the motivation of implementing a computerized process.

As per claim 26, Tom fails to disclose wherein soliciting the sub-population identified comprises one of: calling each of a plurality of members of the sub-population, mailing a solicitation to each of the plurality of members of the sub-population..., but does disclose a system that uses decision process and model to perform an evaluation" in Col. 7, lines 10-22.

However, Kohavi discloses:

wherein soliciting the sub-population identified comprises mailing a solicitation to each of a plurality of members of the sub-population, (Col. 1, lines 52-57, [mail sent only to people who are labeled by classifier). Kohavi discloses this limitation in an analogous art for the purpose of sending mail to a population during a campaign.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to mail a solicitation to each of a plurality of members of the sub-population with the motivation of utilizing postal services for solicitation.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tom (US 5,696,907) as applied to claim 1 above, and further in view of Amado (5,701,400).

As per claim 9, both Tom fails to disclose wherein soliciting the sub-population identified comprises e-mailing a solicitation to each of a plurality of members of the sub-population, however, Tom does disclose a system that uses decision process and models to perform an evaluation in Col. 7, lines 10-22.

However, Amado discloses:

wherein soliciting the sub-population identified comprises e-mailing a solicitation to each of a plurality of members of the sub-population, (Col. 25, lines 50-53, [E-mail]). Amado discloses this limitation in an analogous art for the purpose of showing that E-mail can be used to generating diagnostics.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to e-mail a solicitation to each of a plurality of members of the sub-population with the motivation of showing that a solicitation can be sent electronically

***Allowable Subject Matter***

9. Claims 12, 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 12, 25 are objected to because prior art does not disclose having a solicitation group with a first value and a non-solicitation group with a second value in a sample population and setting purchase variables to the first value for each of the members of the population that made a purchase and to the second value for each of the plurality of members for the population that did not make the purchase.

***Response to Arguments***

10. Due to the amendment filed 7/26/04, the 35 U.S.C. 112 rejection has been withdrawn by the examiner.

11. Applicant's arguments filed 7/26/04 have been fully considered but they are not persuasive.

The applicant has made amendments to independent claims 1, 11 and 24, however, these amendments do not put the claims into a form required by 35 U.S.C. 101 as discussed above in the rejection. Therefore, claims 1-22 and 24-26 still stand rejected under 35 U.S.C. 101.

As per claims 1 and 10, the applicant argues that Tom does not teach identifying and soliciting the sub-population identified or using a decision theoretic model in connection with identifying a sub-population to solicit so as to maximize an expected increase in profits. The applicant argues that minimizing loss is not analogous to maximizing profit. However, in Col. 7, lines 10-22, Tom discloses selecting10% lowest and highest applications, and evaluating a set of sample financial service applications using a hierarchical neural network model. In this case, the sub-population is represented by the population that submits the financial service applications. The decision theoretic model is represented by using a hierarchical neural network model to make a decision as to select the 10% lowest and highest applications, which were submitted by the sub-population. These applications are selected so as to minimize the increase in loss. This minimization of loss does represent the maximization of profits

since the lower the loss, the greater the profit. In addition, on page 10, last line –11 first line of the applicant's arguments, the applicant admits that a factor in maximizing profit results from minimizing loss or cost, therefore it is evident that the minimization of loss in Tom does represent the maximization of profits of the present invention. Also, as described above in the rejection, Tom doesn't specifically use the word "solicit", however, the performance of risk and credit analysis on financial service applications represents the solicitation since financial applications can be evaluated for risk and credit analysis in order to urge, entice or lure an applicant into getting a financial service.

As per Claims 2-4, 6 and 8, the applicant argues that Tom does not disclose using a decision theoretic model using a decision tree. The applicant argues that since Tom states "using a neural network that is not computationally intensive" and describes that the neural network is optimized by a non-iterative regression process, and therefore teaches away from the applicants' claimed invention. However, utilizing a non-iterative regression process does not teach away from the invention. The purpose of this regression process is to optimize the neural network weights. Nevertheless, Tom does disclose a system that uses decision process and model to perform an evaluation in Col. 7, lines 10-22, and in combination with Kohavi, the decision tree is disclosed. In Col. 3, lines 10-16, Fig. 6 [616] of Kohavi, a decision tree structure is presented.

The applicant also argues that neither Tom or Kohavi teach a solicitation variable used to maximize profits. The applicant also argues that Kohavi's likeliness to respond is not analogous to maximizing profits. However, the combination of Tom and Kohavi

discloses this feature. Specifically, in Kohavi, the solicit variable is represented by the make route node of a decision node, and the non-solicit value is represented by make route node of a leaf node as shown in Figure 6. These nodes are utilized to aid in processing decision tree results. Kohavi was introduced to show that variables are used with decision trees in order to make decisions for the classification of records. As disclosed in preceding paragraphs, Tom already discloses a decision related to the maximization of profits, and in combination with Kohavi, this solicitation variable is used to make the decision.

As per claim 6, the applicant argues that neither Tom nor Kohavi disclose a purchase variable. However, Tom discloses a purchase variable in Col. 4,lines 57-59, where a automobile purchase indicator variable is disclosed.

As per claim 5, the applicant argues that claim 5 recites providing a value for a probability conditional on at least a purchase variable having a first value corresponding to purchase and a second value corresponding to non-purchase, and also argues that neither Tom nor Kohavi disclose this limitation since, according to applicant, do not disclose a purchase variable. However, as disclosed in preceding paragraphs, Tom discloses a purchase variable in Col. 4,lines 57-59, where a automobile purchase indicator variable is disclosed. In addition, Pilipovic discloses a buy/keep decision in Col. 92, lines 23-28, where a decision is made such that if the projected data includes a datum greater than a sale price for a financial product then making a buy decision, and if the projected data includes a datum less than the sale price, then making a sell

decision. In this case, the datum greater than a sale price represents the first value and a datum less than the sale price represents the second value.

Claim 7 recites limitations similar to claim 5 and is therefore rejected for the same reasons as disclosed with respect to claim 5.

As per claims 11 and 24, these claims recite limitations similar to claim 1 and is therefore rejected for the same reasons as disclosed with respect to claim 1.

As per claim 13, the applicant argues that Kohavi does not describe the employment of a greedy approach to constructing a decision tree since, according to applicant, involves an iterative process of constructing the tree based upon comparison of predetermined scoring criteria for various tree constructs. However, in Fig.5, [500], a plurality of interim leaf nodes shown in [516, 520,524, 528, and 532]. This represents a greedy approach since the tree is being constructed by spitting instances on the tree. These splits are determined through comparison of instances to attributes. These attributes represent the scoring criteria.

As per claims 16 and 17, the applicant challenges examiner's official notice and asks that the examiner provide a reference in support of using a marginal likelihood criterion or an adjusted likelihood criterion. Pilipovic does not specifically disclose these features, but does suggest them through the disclosure of mathematical and statistical techniques that have been used to estimate the likelihood of future events in Col. 1, lines 22-31. The estimation of the likelihood of future events represents the marginal likelihood criterion since this likelihood is used as a basis for making financial decisions. Second, Pilipovic discloses adjusting the means for programming and then testing for

accuracy by preprocessing input test market data, entered at the means for inputting data, to calculate projected test data for each of the variables and followed by preprocessing the projected test data, the adjusting being carried out until the means for programming is adjusting sufficiently to derive processed data that converges to a portion of the input test data in col. 93, lines 40-48. This adjustment is made to make sure that input market data is accurate during the estimation process, and as mentioned above, the likelihood of future events is what is being estimated in Pilipovic.

Claim 22 recites limitations similar to claim 1 and is therefore rejected for the same reasons as discussed above with respect to claim 1.

Claim 9 depends from claim 1, and is therefore rejected for the same reasons as discussed above with respect to claim 1.

***Conclusion***

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akiba K Robinson-Boyce whose telephone number is 703-305-1340. The examiner can normally be reached on Monday-Tuesday, 8:30am-5pm, and Wednesday, 8:30am-12:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on 703-305-9643. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7238 [After final communications, labeled "Box AF"], 703-746-7239 [Official Communications], and 703-746-7150 [Informal/Draft Communications, labeled "PROPOSED" or "DRAFT"].

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

A. R. B.
October 19, 2004

TARIQ R. HAFIZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600